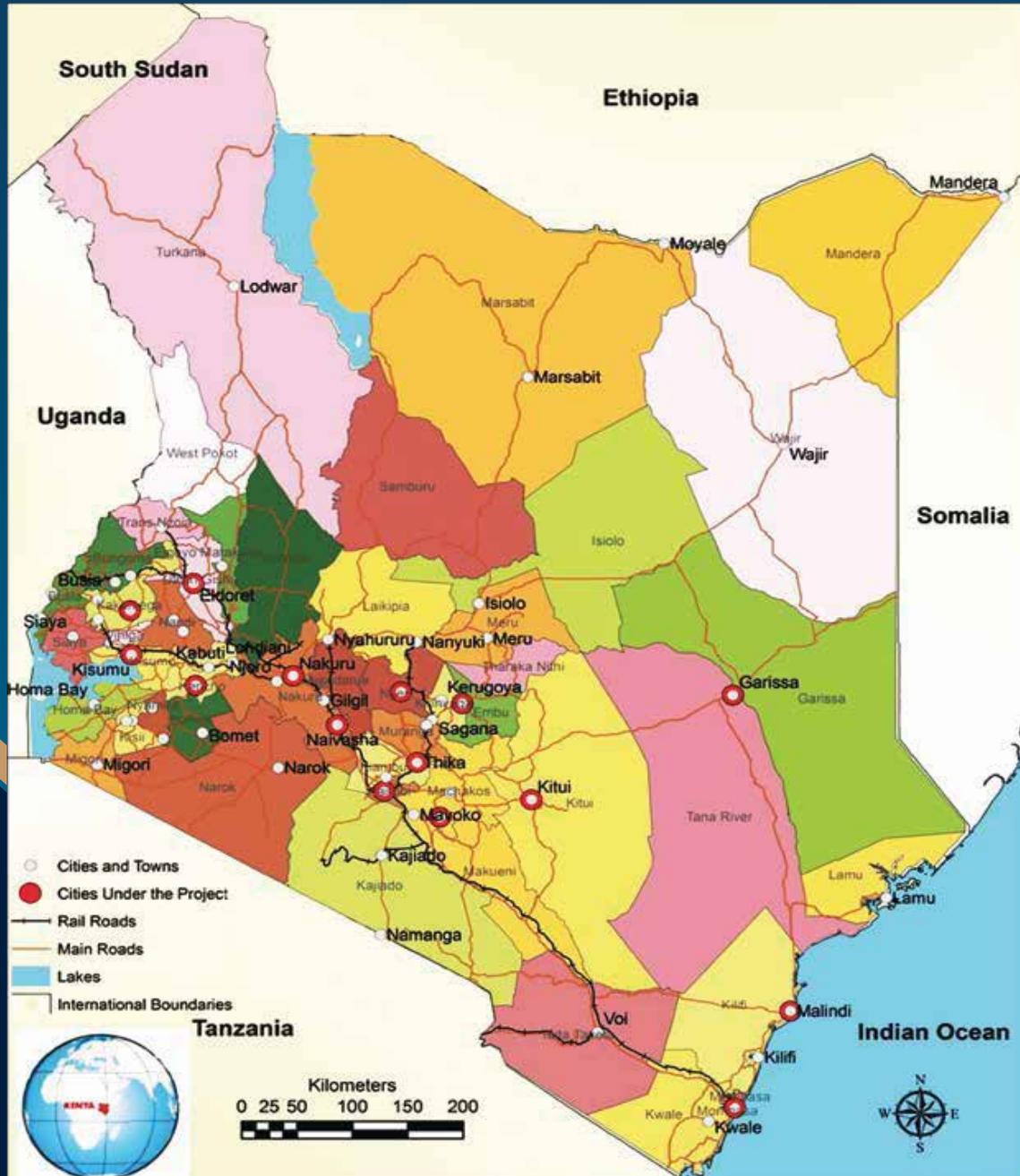


Kenya

STATE OF THE CITIES



NYERI

KENYA STATE OF THE CITIES BASELINE SURVEY

STATISTICAL ABSTRACT FOR NYERI, KENYA

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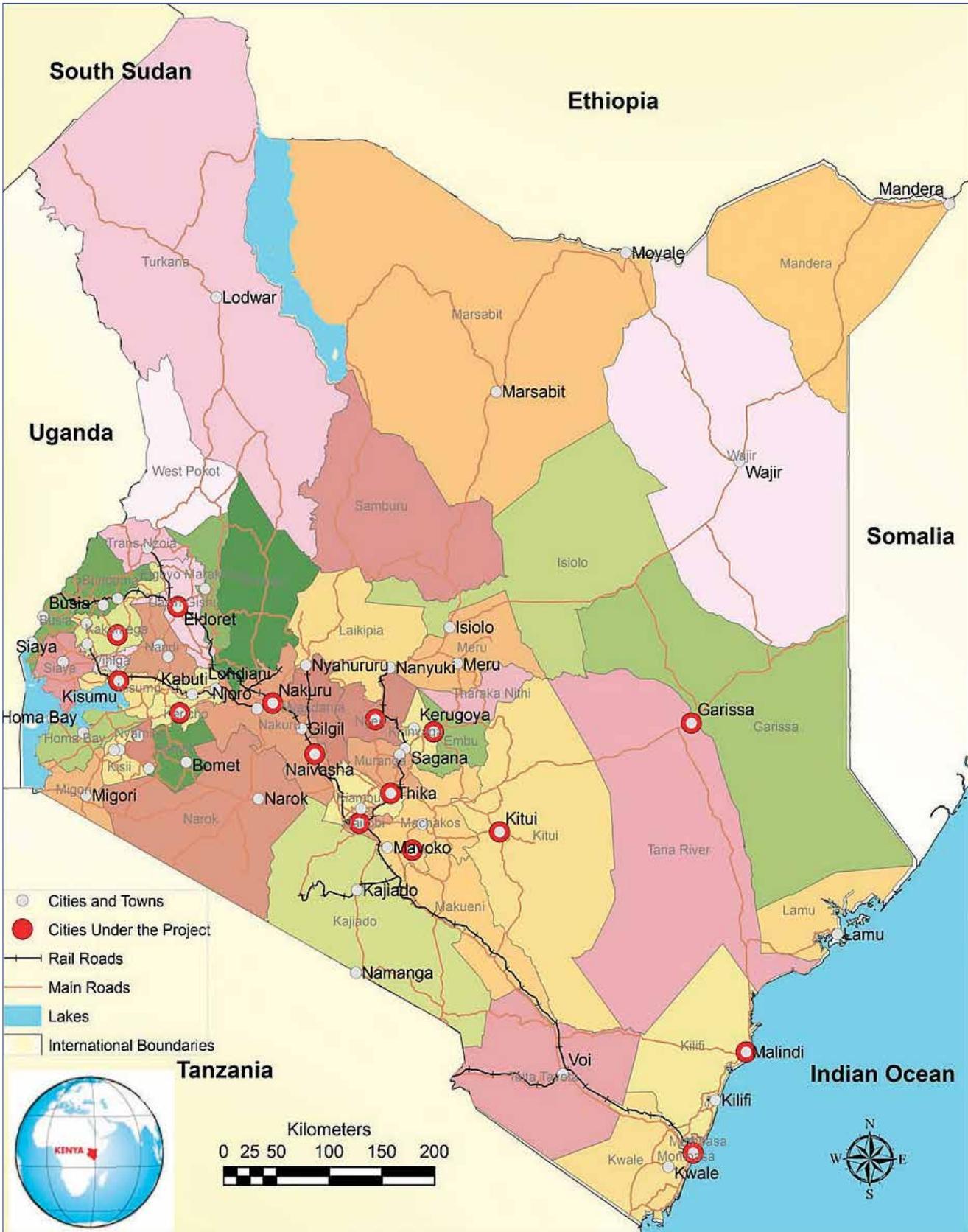
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ABBREVIATIONS

CAPI	Computer Assisted Personal Interview
EA	Enumeration Area
GOK	Government of Kenya
HH	Household
HUD	U.S. Department of Housing and Urban Development
KIHBS	Kenya Integrated Household Budget Survey
KISIP	Kenya Informal Settlements Improvement Program
KMP	Kenya Municipal Program
KNBS	Kenya National Bureau of Statistics
NMSP	Nairobi Municipal Service Project
PDA	Personal digital assistant, in this case a hand held computer used by interviewers
PSU	Primary Sampling Unit
SMSA	Standard Metropolitan Statistical Area
SRS	Simple Random Sample
SSU	Secondary Sampling Unit
WB	World Bank
WBG	World Bank Group

KENYA STATE OF THE CITIES BASELINE SURVEY: CITIES COVERED



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INTRODUCTION

Background

The Kenyan government, with the support of development partners, is increasing its investments in urban infrastructure and services. To support these efforts, the World Bank has contracted NORC at the University of Chicago to carry out a baseline study of the demographic, infrastructure, and economic profiles of fifteen Kenyan towns and cities: Nairobi City, Mombasa, Naivasha, Nakuru, Malindi, Eldoret, Garissa, Embu, Kitui, Kericho, Thika, Kakamega, Kisumu, Machakos, and Nyeri. This was undertaken in order to deepen understanding of the cities' growth dynamics, and to identify specific challenges to quality of life for residents. The study, called the "Kenya State of the Cities Baseline Survey," collects and analyzes household survey data to produce key statistics and identify differences in conditions among types of households—especially differences between those living in informal versus formal settlements. The ultimate goal is to use the information to establish development priorities for infrastructure and service investments and, eventually, to track the effectiveness of these investments.

Prior to the State of the Cities survey, there were little data available to support the design of programs to improve infrastructure and related services in most Kenyan cities. While there have been several household surveys of Nairobi's informal settlements and numerous analyses using the data, few surveys or analyses have been carried out in other Kenyan towns and cities or for modest-income areas in Nairobi.

To facilitate access to the rich datasets generated by the survey, three written products were commissioned: a Statistical Abstract (such as this one) for each city, a City-at-a-Glance for each city (a two-page summary of the Abstract), and an Overview Report (a more comprehensive discussion of the topics in this Introduction, a topic-by-topic comparative analysis of the fifteen cities, and appendices with the survey instrument). The Abstract's objective is to provide comprehensive but easily accessible information on the wide range of municipal conditions covered in the survey, as reported by households. Some information in the Abstract also comes from secondary sources, such as the national Census and the Kenya Integrated Household Budget Survey (KIHBS). The primary audience for the Abstract includes policy makers, development practitioners, development partners, civil society organizations, and urban residents. Better planning and more productive investments can result from exploiting the information in each city's Abstract.

Methodology

For this baseline household survey, NORC used a two and three-stage, stratified, clustered sampling design intended to be representative of poor and non-poor households living in formal and informal settlements in the fifteen cities included in the study. The first-stage sampling frame was based on Kenya's 2009 census frame of enumeration areas (EAs). In the census sample frame, EAs are identified as urban, peri-urban or rural. EAs are further identified as containing formal or informal settlement types. For the first stage sampling, NORC selected EAs from strata identified as informal (slum), urban-formal, peri-urban-formal and rural. In cases where the EAs were "large" (200 to 700 households), they were divided in half, thirds, or quarters and one segment was randomly selected.

For the final stage of sampling, NORC carried out a full household listing in each selected EA (or segment, as the case may be) and randomly selected ten households for interviewing.¹ Because expected response rates were unknown prior to data collection, interviewers were given a target to complete at least seven interviews in each EA. In Nyeri, 143 EAs were selected in the first stage. In the second stage, a total of 9,475 households were listed and 1,454 households were selected.

The data for this report are based on 1,024 completed interviews carried out in Nyeri from November 12, 2012 to February 28, 2013 by a team of five interviewers and one supervisor. Among eligible households,² the completion rate was 70.43%.³ Data collection took place in both formal and informal settlements simultaneously; 103 interviews were completed in informal settlements and 921 were completed in formal settlements.

Questionnaire

The Kenya State of the Cities baseline questionnaire was developed iteratively using a base set of questions developed by the World Bank and refined to capture the key variables related to infrastructure access and municipal services of interest to the Kenyan government. The final fielded questionnaire is available in Volume II of the Overview Report. The household listing form and the questionnaire were programmed for use as a Computer-Assisted Personal Interview (CAPI) and both were carried out using 7-inch Samsung Galaxy Tab tablet computers which transmitted data to project servers via the mobile phone network. Interviewers used the tablet computers to capture GPS coordinates once during listing and again at the end of each interview.

Data Quality

Recorded administration time of the CAPI instrument showed a median duration of 20 minutes in Nyeri (21 minutes across all towns and cities). However, duration values may have been compromised by transmission problems and supervisor reviews, which may have overwritten timestamps. Despite the uncertainty of exact durations, data quality measures do not show systematic interviewer-related errors in the final data. Approximately one-third of all interviews underwent validation, including call-backs by supervisors or central office staff (in-person and by phone).

Table Presentation

Each city's Abstract includes a set of tables designed to provide basic information on households' economic and demographic conditions, their housing conditions, and access to infrastructure and services. One challenge in preparing the Abstract was to provide a complete picture of conditions while still being selective in the information presented so as not to overwhelm the reader. A second challenge was to display the information in a way that permits stakeholders to understand conditions faced by different population groups.

¹ A complete description of the sampling design is found in "Kenya Municipal Program State of Cities: Overview Report," NORC, August 2013.

² Eligible households are defined as occupied dwellings with at least one resident age 18 or older who is present during the field period.

³ The completion rate is the number of households that successfully completed an interview over the total number of households assigned.

To meet these challenges we have developed a set of tables with items believed to be most important for stakeholders and have broken down the items in several ways. In addition to providing an overall picture of household (HH) characteristics, the tables illustrate whether household characteristics differ by key factors. The rows of each table generally list the household characteristics (e.g., size of household, percentage of children in school). The columns present statistics for the entire city, then show how the data differs by location (informal vs. formal areas), household poverty status (poor vs. non-poor), gender of the head of household (male vs. female headed, for informal areas only), as well as other factors pertinent to the particular table.⁴

From each table, one can quickly observe if there are large differences in household characteristics by location, spending power, etc., simply by comparing the cells (numbers). Each table also shows whether the observed differences are statistically significant.⁵ “Statistically significant” means that statistical analysis has revealed that a difference, no matter how small or large, is unlikely due to chance or randomness. In practice, statistically significant differences are the ones researchers are interested in—they can be interpreted as telling us about meaningful differences in household characteristics by location, spending power, gender, or other category. When we discuss differences in the text of this report, we will refer to “statistically significant” differences unless otherwise noted.

In terms of policy decisions, whether differences matter is a combination of whether they are statistically significant and how large the differences are. Ultimately, it is up to the policy practitioner to decide how large a difference must be to matter in the context of interest. An important note when interpreting results is that statistical significance does not imply causality. In other words, if differences in values are statistically significant, this does not mean that one variable caused a change in the other variable. Another factor may be influencing both variables; for example, for we may find a “significant” difference between head-of-household education and household poverty, perhaps the key common cause is social status, which affects both their educational attainment and job/spending opportunities. Additionally, where a statistically significant difference is identified it does not imply the direction of the relationship. Perhaps the household poverty is the reason for the different education levels, or vice-versa. In this report, therefore, we will say a household characteristic is “associated with” or “correlated” with certain factors, rather than saying one is caused by another.

In order not to clutter the tables yet provide the reader with the maximum information, we mark statistically significant results in the tables with bold (for two adjacent values in the same row) and italics (to compare adjacent columns of data). Underlined values denote an insufficient number of household responses for some enumeration category of the sampling design to perform a test of statistical significance. The number of observations for a particular variable is noted in the tables in rows denoted by “N”. Cells with no observations are indicated with hyphens (-).⁶ The table, below, summarizes the

⁴ Informal/formal status was defined at the enumeration area level by the Kenya National Bureau of Statistics during the 2009 Census. Poor/non-poor is defined using the answer to a question asking respondents whether their total household expenditure in the last month was above or below a poverty line calculated using the household size (5,567 KSh for each adult 15 years and older + 3,619 KSh for each child aged 5 to 14 + 1,336 KSh for each child under 5 years old).

⁵ Statistical significance is noted when a test achieves a p-value ≤ 0.05 .

⁶ Regarding issues of non-response, both observational and item-specific, see Section 4, below.

formatting used in tables throughout the Abstract: A value that is both bold and italicized indicates statistically significant differences for two adjacent cells (i.e., values in the same row) as well as for the distributions between adjacent columns. In contrast, a value in standard font—no bolding, italics, or underlining—still means that a significance test was performed but that the values under comparison were not statistically significantly different from each other.

There is one caveat to the formatting rules that must be addressed regarding the significance testing of distributions. While the absence of italics sometimes means that the distribution was tested and was not found to be statistically significant, this is often not the case—i.e., there are many distributions which were not tested for significance. To avoid confusion, the comprehensive list of distributions which were tested for significance follow.

- **Table B.2a:** Expenditure ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table B.2b:** Income ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table C.3:** Distribution of home value ranges and rent ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table D.1a:** Percent of households with a piped water connection inside their dwelling by security of ownership; percent of households with a piped water connection inside their compound by security of ownership; percent of households close to piped water access by security of ownership; cost of water by security of ownership; most important water source by security of ownership; reasons for no connection by security of ownership
- **Table D1.b:** Water source by water quality; water provider by water quality; water treatment buy water quality; treatment methods by water quality.

Another feature of the data worth mentioning is that outliers (responses that are very different from all the others) were not a major issue in the survey data, affecting just three variables in any important way.⁷

Finally, note that in tables presenting a distribution of responses, if some response categories are left out then the distribution will not add up to 100%. In cases where all response categories are listed then the first row of responses is given as 100. Unless otherwise noted, all figures presented in the tables are percentages.

⁷ Across all fifteen towns and cities these were (i) home value, in which 20 responses were reported in millions units instead of as the value itself (so we simply divided these responses by a million); (ii) 40 respondents reported travel time for a weekly or monthly commute rather than a daily commute (these over-eight-hours responses were dropped); (iii) we removed one case in which the time to get water was over a week.

Table 1: Description of formats used to denote statistical significance

Format	When we use it	Example
Bold	Two bolded values in the same row next to each other indicate that the difference is statistically significant. We also use bold for ‘Yes’ or ‘No’ variables. If bold, it means that the difference between the mean of households that answered ‘yes’ (displayed) and the mean of those that answered ‘no’ (not displayed) is statistically significant. ^(a)	Table A.1 displays the mean household size for households located in formal and informal settlements; if the pair of values is bold, it means that the difference in household sizes between formal and informal areas is statistically significant. Table B.2 displays the proportion of households which own land (or have tenure) that fall below the poverty line. If bold, it means that this proportion is statistically significantly different from the proportion of households which do not own land that fall below the poverty line.
Italics	We indicate statistically significant differences between columns of three or more cells using italics; this means the difference between the entire distributions (columns) is statistically significant. ^(b)	Table B.2, Monthly household spending power, displays the distribution of households across income and expense ranges. If values appear italicized in both columns for households located in formal and informal settlements, the difference between the two distributions is statistically significant.
Underline	Denotes values where, due to lack of data at the census tract (enumeration area, or EA) level, it was not statistically possible to conduct the significance test. ^(c)	Table B.3 shows the mean value of households’ primary residence with and without land, and of any other residence and/or land. An underlined value means that due to lack of data at the census tract level, it is not possible to perform a test for significant differences.
Hyphen (-)	In cases where there are no data for a cell at all, we note that with a hyphen (-).	Table B.3 shows data related to household finance. For the percentages of households according to source of financing, the cells that display a hyphen means that there were no observations for that particular variable and category.

Notes:

- a. Here a *p*-test from an Adjusted Wald test is conducted.
- b. Here Pearson’s Chi-squared test is conducted.
- c. At least two households are required to compute a household-level variance, which is required to conduct a hypothesis test. Note that this does not imply that the respective table values are based on just one household or even just one EA.

The core of this abstract comprises a set of tables divided into chapters. Each chapter contains a textual summary of each table and highlights some of their implications. The tables are divided into four groups:

- A. Household characteristics – 3 tables
- B. Economic profile – 5 tables
- C. Tenure, tenure security, dwelling characteristics – 4 tables
- D. Infrastructure services – 7 tables

Notes to the tables are identified by small letters appearing as superscripts at the end of each table. All tables present weighted figures at the household level, unless otherwise noted, to reflect the total population of the respective table cell. The N values, however, present the unweighted number of households, unless otherwise noted.

The final chapter of this abstract contains a series of three “Development Polygons”. These complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. The figures included are the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.⁸

While the tables generally have a common set of column headings, there is some variation. The following are definitions for those headings that require clarification:

- *Informal/Formal Areas* – This distinguishes between areas based on whether most households in the area have property title and official services. It is a designation provided by a status code at the level of the EA (Enumeration area) as used by the National Census.
- *Gender (Informal)* – For the households living in the locations coded as “Informal,” data for household characteristics are provided for both male- and female-headed households. As is standard, the male-headed households may contain the spouse while female-headed households do not.
- *Class (of durable)* – Durable assets are a standard measure of household wealth. They are grouped into three classes, roughly based on their likely market value and degree of permanence. The actual items in each class are indicated in the table. The values reported for these categories are the number owned by the household, not their average or total value.
- *Spending Power* – The total value of household expenditures collected by the survey, excluding rent or mortgage payments.
- *Access to Infrastructure* – This indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5. See NORC (August 2013), “Kenya Municipal Program State of the Cities: Overview Report” for a more detailed description.
- *Household Poverty* – The poverty line varies depending on the number of members of the household and their age. It is calculated by adding together:
 - 5,567 KSh per month for each adult 15 years and older in household,
 - 3,619 KSh per month for each child aged 5 to 14 in household,
 - 1,336 KSh per month for each child under 5 years old in household.

⁸ The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

HOUSEHOLD CHARACTERISTICS

This section presents basic household characteristics. Table A.1 provides information on household size and household member distribution by age category. Table A.2 details the level of education of the members of household, as well as the proportion of children and adults of different ages who were currently in school at the time of the survey. Finally, Table A.3 presents household health characteristics, including the proportion of children under 15 who have received the BCG vaccine (an immunization against tuberculosis), a major public health concern given that Kenya is a high-tuberculosis-burden country.⁹ Table A.3 also includes the number of household members with an illness or injury in the two weeks prior to the survey, the proportion of those members who visited a health practitioner, average household medical expenditures for the month preceding the survey, and the percentage of households that have health insurance. All of these figures are given comprehensively and broken down by location type, the household's poverty status, and the gender of head of household (among informal areas).

A.1 Household Demographic Composition

The 2009 census estimated that the municipality of Nyeri had a population of 119,353, an 18% increase over the figure reported in the 1999 census; this represents of a 1.7% annualized average growth rate.¹⁰

The average household size in Nyeri, as reported by survey respondents, is 2.6 members. The average poor household is significantly larger than the average non-poor household (3 vs. 2.25 members, respectively). The average household size also varies by location type: while the average household size in formal areas is 2.7 members, it is 2.3 in informal areas. When it comes to the gender of the household head, male-headed households are, on average, larger than female-headed households; although, this difference is not statistically significant. Only results that proved statistically significant are described in this abstract. On average, about 89% of households' members are aged 5 to 60 years old—1.7% are between 5 and 14 years old, 73% are between 15 and 60, 10.6% are under 5 and 4.5% are over 60. The head of household is female in 27% of all households. Ninety-four percent of female-headed households are located in formal areas. There are significant differences in the age distribution of household members by location type and poverty status. While households in formal areas are more likely to be composed by members less than 14 years old than those in informal areas, they are less likely to be comprised of adults between 15 and 60 years old. By poverty status, we find a similar pattern; while poor households are more likely to host individuals under 14 years old, they are less likely to be composed by adults between 15 to 60 years old than non-poor households. Further, in informal areas, an average of 12% of female-headed household members are over 60 years old, compared to less than 1% of male-headed household members.

⁹ World Health Organization Global tuberculosis report 2012, retrieved June 12th 2013 from http://www.who.int/tb/publications/global_report/en/

¹⁰ From Statistical Abstract 2010 and Statistical Abstract 2006, Kenya National Bureau of Statistics.

Table A.1: Household demographic characteristics

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of households							
Weighted	29,003	1,259	27,744	14,587	14,222	776	454
N (unweighted)	1,024	103	921	510	507	61	39
Size of household	2.64	2.32	2.65	3.02	2.25	2.52	1.98
N	1,024	103	921	510	507	61	39
Mean percent of household members aged:							
Total	100	100	100	100	100	100	100
Under 5	10.6	5.8	10.8	13.1	8.2	6.5	3.8
5 to 14	11.7	7.8	11.9	13.8	9.5	6.8	9.9
15 to 60	72.9	80.9	72.6	67.6	78.5	85.6	73.9
Over 60	4.5	5.1	4.5	5.3	3.6	0.7	11.9
N	1,024	103	921	510	507	61	39
Proportion of households...							
Male-headed	73	63	73	75	71		
Female-headed	27	37	27	25	29		
N	987	100	887	489	494		
Female-headed distribution		6	94	46	54		
N		279	277				

A.2 Household Education Characteristics

Nyeri was part of the Central Province, where in 2009 primary classrooms had an average class size of 36 students and secondary classrooms had on average 33 students. Student-teacher ratios in the former Central Province were, on average, 34.5 for primary schools and 21 for secondary schools.¹¹

The first panel of Table A.2 presents statistics on the education of all individuals aged 5 years and older within the surveyed households. About 42% of all individuals have completed secondary school or higher—a figure that is likely skewed by the fact that the majority of household members are between 15 and 60 years old—and 69% completed primary or higher. A significantly higher percentage of household members in formal areas have completed higher education, compared to individuals from informal areas (16% vs. 5%). In addition, while members of poor households are more likely to have completed only some primary, primary and some secondary education than household members from non-poor households, those individuals from non-poor households are more likely to have completed higher education than those from poor households (24% vs. 9%). Six percent of individuals reported having “no education”, and it is significantly more common among household members in informal areas than in formal ones (17% vs. 6%).

¹¹ Provinces no longer exist in Kenya. This data is based on the Kenyan Institute for Public Policy Research and Analysis 2009 Economic Report, Table A3.16, pg. 192, per Ministry of Education statistics, http://www.marsgroupkenya.org/pdfs/2009/10/Kenya_Economic_Report_2009.pdf Section

The second panel of the table shows the mean percent of adult individuals over 18 years within each household. This is done to show intra-household educational levels among households' adult members. We find that on average, 55.4% of a Nyeri household's adults have completed secondary school or higher (34.4% completed secondary, while 21% completed higher education). About 8% of a household's adults had no education whatsoever. The remaining 35.8% completed some primary, all of primary, or some secondary schooling. We also found interesting differences between households in formal and informal areas. In informal areas, a significantly higher percentage of household's adults had no education or completed some or all of primary school, while a significantly lower percentage completed higher education past secondary than in formal areas. In poor areas, while a significantly higher percentage of households' adults completed some primary, primary school or some secondary education, a larger proportion of members in the average non-poor household completed higher education.

Furthermore, 93.1% of individuals aged 5 to 14 years old are currently in school; this figure is almost 62% for individuals 15 to 18 and 9% for individuals over 18. The percentage of individuals over 18 that are currently in school is significantly higher among non-poor households than poor households (11% vs. 7%).

Table A.2: Household education characteristics

Characteristic	All	Location		HH poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of individuals 5 and older with highest grade completed:							
Total	100	100	100	100	100	100	100
None	6	17	6	7	6	14	23
Some Primary	24	27	24	28	20	27	28
Completed primary	15	15	15	17	12	17	11
Some secondary	12	14	12	14	9	14	13
Completed secondary	27	23	28	26	30	24	19
Higher	15	5	16	9	24	3	5
N	2,252	218	2,034	1,261	974	140	73
Mean percent of household's adults over 18 with highest grade completed:							
Total							
None	8.4	20.0	7.9	10.0	6.6	14.1	29.5
Some Primary	7.4	16.4	7.0	10.1	4.6	17.3	15.8
Completed primary	16.8	16.9	16.8	19.8	14.0	20.5	12.0
Some secondary	11.6	10.8	11.6	15.2	8.1	13.9	6.2
Completed secondary	34.4	30.3	34.5	32.2	36.5	30.9	28.8
Higher	21.0	4.5	21.7	12.0	30.0	2.7	5.8
N	1,023	103	920	509	507	61	39
Percent of individuals in school by age group:							
5 to 14	93.1	<u>95.2</u>	<u>93.0</u>	<u>92.3</u>	<u>94.1</u>	<u>91.8</u>	<u>100.0</u>
N	319	<u>23</u>	<u>296</u>	<u>186</u>	<u>131</u>	<u>14</u>	<u>9</u>
15 to 18	61.9	<u>55.1</u>	<u>62.4</u>	<u>61.4</u>	<u>61.9</u>	<u>48.4</u>	<u>72.3</u>
N	101	14	87	62	38	10	4
Over 18	9.0	4.8	9.2	7.0	11.1	5.2	4.4
N	1,018	103	915	507	504	61	39

A.3 Household Health Profile

Nyeri was part of the Central Province, which in 2005 had an average of 10 doctors and clinical officers per 100,000 residents and 66 nurses per 100,000 residents.¹² The former Central Province had 17 medical facilities per 100,000 residents, including hospitals, clinics, dispensaries, and other types of facilities.¹³

Overall, 97% of households’ children under 15 have received BCG (tuberculosis) immunizations, with no statistically significant variation between groups. Sixteen percent of households had a sick or injured household member in the two weeks prior to the interview, a number which is significantly higher among poor households than among non-poor households (21% vs. 12%). Seventy percent of these visited a health practitioner. Rates of health insurance coverage are quite low (30%), and vary significantly by area type (31% in formal areas vs. 10% in informal areas) and poverty (37% in non-poor households vs. 24% in poor households).

Table A.3: Household health characteristics

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of household’s children under 15 having received BCG immunization	97	98	97	96	97	97	100
N	479	34	445	280	197	22	11
Percent of households with an injured/ill member, previous two weeks	16	13	17	21	12	13	12
N	1,024	103	921	510	507	61	39
Percent of ill household members that visit a health practitioner, previous two weeks	70	<u>75</u>	<u>70</u>	<u>71</u>	<u>68</u>	<u>67</u>	<u>85</u>
N	161	13	148	100	59	7	5
Household medical expenditures (KSh), previous month	828	391	847	604	1,067	356	265
N	1,022	102	920	509	507	60	39
Percent of households with health insurance	30	10	31	24	37	12	8
N	1,024	103	921	510	507	61	39

¹² 2004/2005 numbers of healthcare providers obtained from Partners for Health Reformplus 2006 Report, Table A1, pg. 39, Annex A, statistics obtained from Rep. of Kenya. www.healthsystems2020.org/files/1654_file_Tech101_fin.pdf. Per capita figures calculated by dividing by 2005 (estimated) population obtained from the Kenya Integrated Household Budget Survey, Table 3.1, [http://www.knbs.or.ke/pdf/Basic%20Report%20\(Revised%20Edition\).pdf](http://www.knbs.or.ke/pdf/Basic%20Report%20(Revised%20Edition).pdf).

¹³ Based on most current (undated) figures from Kenya Bureau of Statistics Open Kenya online database, <https://kenya.socrata.com/Health-Sector/Health-Facility-Pie-Chart/yre4-763w>. Per capita figures calculated by dividing by 2009 census population, obtained from 2010 Statistical Abstract, Kenya National Bureau of Statistics.

HOUSEHOLD ECONOMIC PROFILE

B.1 Household Occupational Composition

Table B.1 presents the current occupation, or main activity, of household members. The first panel shows the percent of all adults over 18 in each of the occupations. The five most prominent occupation categories are casual employee, regular employee, self-employed, homemaker, and student, which together comprise almost 90% of all adults in Nyeri over 18 years old. Individuals in formal areas are significantly more likely to be regular employees than individuals in informal areas (10.1% vs. 2.1%), and interestingly, are significantly less likely to be employers, although the difference is quite small (0.8% vs. 0.1%). Individuals in non-poor households are significantly more likely to be regular employees and self-employed, while they are significantly less likely to be homemakers than adults from poor households. One interesting and statistically significant finding is that members of female-headed households in informal areas are considerably less likely to be casual employees than members of male-headed households in those areas (19.3% vs. 50.3%).

The second panel shows the average percent of adults over 18 within each household that are occupied in each of the categories. This is done to show intra-household occupational status among households' adult members. The results here are similar to those in the first panel above. Here, we find that on average, about 58% of a household's adult members are either regular employees, casual employees, or self-employed. About 27% are homemakers, 3.3% are unemployed but looking for work, and almost 7% are students; no other category includes more than 1.5% of adult household members. Our survey found that in formal areas, the average percentages of households' adults who are regular employees and students are considerably higher than in informal areas, while the average percent of adults who are self-employed is slightly higher in informal areas, but still significant. Compared to non-poor households, poor households contain, on average, a significantly higher percentage of adults who are casual employees and homemakers, and a significantly lower percent of adults that are regular employees and self-employed. In informal areas, male-headed households contain significantly higher average percentages of adults who are casual employees than do female-headed households (54.6% vs. 20%). Interestingly, the average female-headed household contains a significantly higher percentage of adults that are self-employed (24.2% vs. 8.9%), and homemakers (38.1% vs. 23.6%) than do male-headed ones.

Table B.1: Household members' main activity

Occupation ^a	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of adults over 18 with occupation:							
Employer	0.1	0.8	0.1	0.0	0.3	0.6	1.3
Regular employee	9.8	2.1	10.1	5.8	14.7	1.7	3.1
Casual employee	32.7	39.4	32.4	34.6	30.8	50.3	19.3
Self-employed	11.8	11.4	11.8	9.3	14.9	7.9	19.8
Unpaid family worker	1.2	0.0	1.3	1.4	1.0	<u>0.0</u>	<u>0.0</u>
Apprentice	0.2	0.0	0.2	0.3	0.1	<u>0.0</u>	<u>0.0</u>
Student	7.3	6.2	7.3	7.3	7.3	5.7	7.8
Pensioner/investor	0.7	0.4	0.7	0.6	0.7	0.0	1.3
Earning from investments/ property	0.5	0.0	0.5	0.4	0.6	<u>0.0</u>	<u>0.0</u>
Sick/unable to work	0.8	0.0	0.8	0.9	0.6	<u>0.0</u>	<u>0.0</u>
Unemployed looking for work	4.1	6.4	4.0	4.9	2.9	6.6	6.6
Unemployed, not looking for work now	1.4	0.4	1.5	1.8	1.0	0.6	0.0
Homemaker	28.3	32.2	28.2	31.4	24.4	26.6	39.0
N	1,715	170	1,545	937	765	109	56
Mean percent of household's adults over 18 with occupation: ^b							
Employer	0.1	1.0	0.1	0.1	0.2	0.6	1.9
Regular employee	9.9	2.7	10.2	5.8	14.1	2.9	2.5
Casual employee	35.0	40.9	34.7	36.3	34.0	54.6	20.0
Self-employed	12.7	14.2	12.6	8.8	16.7	8.9	24.2
Unpaid family worker	1.0	0.0	1.0	1.3	1.3	0.0	0.0
Apprentice	0.2	0.0	0.2	0.3	0.1	0.0	0.0
Student	6.9	3.8	7.0	6.8	6.9	4.2	3.3
Pensioner/investor	0.6	0.3	0.7	0.5	0.8	0.0	0.9
Earning from investments/ property	0.6	0.0	0.6	0.4	0.9	0.0	0.0
Sick/unable to work	0.7	0.0	0.8	0.8	0.4	0.0	0.0
Unemployed looking for work	3.3	5.3	3.2	4.3	2.2	4.8	6.5
Unemployed, not looking for work now	1.1	0.2	1.1	1.4	0.7	0.4	0.0
Homemaker	26.9	30.6	26.8	32.1	21.6	23.6	38.1
N	1,023	103	920	509	507	61	39

Notes:

- a. The category "Other" has been omitted.
- b. These numbers are obtained by first computing the percentages of each household's members in each category, and then taking the mean of these percentages over all households.

B.2 Household Income/Expenditure Levels

There are two general approaches to measure spending power: expenditure and income, both of which are shown in the tables below. In the survey, income derives from household members' salaries, business earnings, rents, public cash support, and earnings from financial assets in the month prior to the interview, but does not include any remittances. Expenditures include all purchases, including investments for household-owned businesses. In theory, both approaches express the same amount of spending power, but typically one approach is not enough, especially when estimations are based on survey data. This is because survey respondents' perceptions about their income and expenditures can be unreliable; estimates vary depending on seasonal changes in economic activities, type of assets owned, household's cash flows, and in-kind payments.

In practice, the expenditure approach is usually more accurate because most respondents, making purchases daily, recall their expenses better. Income, on the one hand, can be problematic because it can be subject to respondent misreporting (e.g., desire to impress the enumerator) and, with non-wage income; respondents do not generally make a clear distinction between revenue (sales) and income (revenue minus expenses). Using both methods, therefore, provides an additional level of verification.

About a half (51%) of all households have monthly expenditures below the poverty line, as determined by the household composition. This proportion is somewhat similar in both formal and informal areas, and surprisingly, it is unaffected when the head of household works either in a "skilled" or in an "unskilled" profession. However, it is significantly lower when the household has a water connection in the dwelling or compound compared to when it does not.

Income and expenditure distributions vary significantly depending on tenure status (only expenditures), water connection, business ownership, and whether the household head is skilled. Whether a household has a water connection or owns a business are particularly strong predictors of income and expenditure levels—households with a water connection or with a business are more likely to fall into the highest income/expenditure categories. Households having a water connection are significantly less likely to be below the poverty line.

On average, households who sent money to individuals outside their household sent around 4,590 KSh in the three months prior to the interview, and those that received money received, on average, almost 9,004 KSh in the same period. Households were more likely to send money than to receive it, and wealthier households were much more likely to send money—79% of households in the top expenditure category sent money to friends or relatives, compared to only 12% of those in the bottom. Although the variation in the proportion of households receiving remittances (transferred income) across expenditures categories is considerably more modest than the expenditures one, there are still differences: among households that earn from 3,001 to 18,000 KSh, the variance in the proportion of those that receive remittances is between 28% and 34%, while among those households in the bottom income category, along with those in the three top income categories, the variance of recipient households is considerably smaller (18-22% of them).

Table B.2a: Monthly household spending power, as measured by expenditure

Characteristic	All	Location		House hold has...			House hold head is ^c		Gender (Informal)		Value of transfer (row pct.) ^d
		Informal areas	Formal areas	Tenure ^a	Water connection	A business ^b	Skilled	Unskilled	Male-headed	Female-headed	
Percent of HHs below poverty line	51	57	50	63	33	51	48	53	58	54	
N	1,017	103	914	226	232	149	372	645	61	39	
Mean expenditure (monthly KSh)	18,477	14,219	18,670	21,013	30,638	23,328	20,886	16,913	13,805	14,163	
N	1,024	103	921	230	236	150	373	651	61	39	
Percent of households with expenditure: ^d											
Less than 3,000 KSh	2	1	2	4	0	0	0	3	0	2	1,383 (12%)
3,001-6,000 KSh	4	10	4	5	2	0	1	6	14	5	1,546 (19%)
6,001-9,000 KSh	13	14	13	8	4	11	10	15	15	12	2,953 (37%)
9,001-30,000 KSh	23	28	23	21	10	12	21	24	24	36	2,873 (36%)
13,001-18,000 KSh	23	25	23	22	18	28	25	22	23	29	3,325 (43%)
18,001-30,000 KSh	23	18	23	26	34	32	28	20	21	12	4,829 (48%)
31,001-75,000 KSh	10	4	10	11	26	15	12	9	4	4	8,219 (61%)
Above 75,000 KSh	1	0	2	2	6	2	3	1	0	0	19,085 (79%)
N	1,024	103	921	230	236	150	373	651	61	39	434
Cash transfers ^e	4,590	<u>3,773</u>	<u>4,632</u>	<u>4,902</u>	<u>7,259</u>	<u>5,866</u>	<u>4,246</u>	<u>4,908</u>	<u>5,573</u>	<u>1,955</u>	
N	282	28	254	78	61	48	102	180	18	9	

Notes:

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- An imputed 30-day value from responses over several periods (7 days for food, 30 days for other consumables, 12 months for durables and annual services). See Volume I in the Overview Report. No significance test performed on this column.
- Transfers are cash outflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

Table B.2b: Monthly household spending power, as measured by income

Characteristic	All	Location		House hold has...			HH head is ^c		Gender (Informal)		Value of remittance (row pct.) ^e
		Informal areas	Formal areas	Tenure ^a	Water connection	A business ^b	Skilled	Unskilled	Male-headed	Female-headed	
Proportion of households with income: ^d											
Less than 3,000 KSh	4	8	3	7	0	1	0	6	7	10	2,655 (18%)
3,001-6,000 KSh	8	23	8	11	3	3	4	11	30	11	7,068 (29%)
6,001-9,000 KSh	18	22	17	15	4	13	14	20	17	29	5,040 (34%)
9,001-30,000 KSh	22	17	22	17	9	25	22	22	17	17	6,229 (28%)
13,001-18,000 KSh	18	18	18	17	18	20	21	16	20	15	10,213 (28%)
18,001-30,000 KSh	17	9	18	19	26	24	19	16	10	7	12,432 (18%)
31,001-75,000 KSh	12	5	12	11	31	11	16	9	0	11	16,823 (19%)
Above 75,000 KSh	2	0	2	2	8	3	3	1	0	0	47,887 (22%)
N	968	101	867	214	224	148	362	606	59	39	250
Cash remittances ^e	9,004	<u>6,489</u>	<u>9,127</u>	<u>9,432</u>	<u>13,804</u>	<u>11,658</u>	<u>8,209</u>	<u>9,472</u>	<u>8,009</u>	<u>4,157</u>	
N	282	28	254	78	61	48	102	180	18	9	

Notes:

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- Total household cash income in KSh, previous month, not including in-kind income or cash assistance from/to family or friends who live outside the household. No significance test performed on this column.
- Remittances are cash inflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

B.3 Household Wealth Composition

The "household wealth index" is calculated from the household's declared ownership of a list of common household items. The value itself is created by totaling the estimated value of each item (indicated in brackets, in USD), converting to KSh, and dividing by 1,000; so the average of 34.1 means that the average household owned approximately 34,100 KSh worth of listed possessions. However, since each possible possession was only counted once, this should not be taken as a reliable estimate, but rather a unitless index of comparison.

This value is significantly higher in formal than informal areas and non-poor vs. poor households. There are significant differences in holdings of Class-1 durables (by area type, poverty status and gender of household head (in informal areas)), Class-2 durables (by poverty status), and Class-3 durables, farm animals and entertainment equipment (by area type and poverty status). Although statistically significant, these differences did not prove considerably large.

Home values are relatively concentrated. The high number of missing or don't know responses to this question means that the averages shown are drawn from a relatively small group and tests of statistical significance were not possible.

Table B.3: Household wealth composition

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Index of household wealth ^a	34.1	23.9	34.6	32.8	35.5	25	22.3
N	1,024	103	921	510	507	61	39
Household's average holdings of:							
Class-1 durables (furniture, pans, iron, mosquito net) [7]	5.8	5.0	5.8	5.6	5.9	4.6	5.5
Class-2 durables (stove, sewing machine, fan, wheelbarrow, water storage tank) [60]	1.3	1.2	1.3	1.2	1.4	1.1	1.1
Class-3 durables (refrigerator, washing machine, electric generator, bicycle) [100]	0.2	0.1	0.3	0.2	0.3	0.1	0
Farm animals (poultry and livestock) [200]	0.4	0.3	0.4	0.5	0.3	0.3	0.2
Entertainment equipment (radio, TV, satellite dish, DVD, video player) [80]	1.9	1.3	1.9	1.7	2	1.4	1.2
Motorized transport (motorcycle [400], car [1,000])	0.0	0	0	0	0.1	0	0
N	1,024	103	921	510	507	61	39
Value of primary residence, not its land (in 1,000 KSh)(b)	332	<u>8,277</u>	<u>139</u>	<u>381</u>	<u>203</u>	<u>8,277</u>	-
N	81	4	77	59	22	4	0
Value of primary residence and its land (in 1,000 KSh) ^b	22,179	<u>26,463</u>	<u>16,597</u>	<u>26,463</u>	<u>16,597</u>	<u>2,071</u>	<u>155</u>
N	149	21	128	91	56	9	12
Value of other land and/or residence (in 1,000 KSh) ^c	18,665	<u>5,940</u>	<u>19,136</u>	<u>23,965</u>	<u>11,942</u>	<u>7,000</u>	<u>203</u>
N	62	3	59	36	25	2	1

Notes:

- This is a class-weighted average of the number of items as disaggregated in this same table, multiplied by the weight given within the square brackets [].
- About 77% of the sample had missing values for this amount, though at about the same frequency across the categories of this table. About half the sample that declared owning land or a residence failed to report its value. Averages are only over households with the asset. See "Proportion of Owners" in Table C.1. Note that values in the last three rows of the table are divided by one thousand.
- Since the survey does not ask the value of these, they have been imputed as a percent of primary residence value where it was declared (see Footnote (b)). These imputations are: land in city (10%), land outside city (5%), residence only in city (40%), and residence only outside of city (28%). If household has both land and structure these are scored separately and added together. In the case where the land of primary residence is not owned the value of the residence is first doubled before the imputations are made.

B.4 Household Finance

Around 51% of all households in Nyeri have a bank account, a number that differs significantly across area type and poor/non-poor status. However, the percentage of households with loans is extremely low, and most loans are obtained from: savings/credit groups or co-ops (5%), relatives or friends (4%), or banks (3%). Households in formal areas are significantly more likely to obtain loans from microfinance institutions (2% vs. zero) than households in informal settlements. Also, poor households are less likely to obtain loans either from banks or saving/credit groups or co-ops than non-poor households. Consistent with findings mentioned above, far more households (44%) sent money to people not living at the household than received money (29%). Significantly fewer poor households send money than non-poor households (36% vs. 52%).

Table B.4: Household finance

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of HH with business ownership, last 12 months	51	25	52	41	62	24	28
N	1,022	103	919	509	506	61	39
Percent of households with a loan	12	14	12	10	15	12	20
N	1,015	103	912	508	501	61	39
Percent of households with a loan from a...							
Bank	3	2	3	1	4	24	28
Microfinance institution	1	0	2	1	2	0	0
Savings/credit group or co-op	5	4	5	3	7	3	6
Relative/friend	4	7	3	3	4	8	7
Informal lender	0	0	0	0	0	0	0
N	1,024	103	921	510	507	61	39
Percent of HHs receiving cash from those not now living at residence ^(a)	29	32	29	29	29	30	35
N	1,023	103	920	509	507	61	39
Percent of HHs sending cash to those not now living at residence ^(a)	44	38	44	36	52	37	41
N	1,019	103	916	507	505	61	39

Over the previous twelve months.

B.5 Household-Owned Business Profile

Sixteen percent of households own a business, most of which (71%) engage in some form of selling. These businesses tend to be fairly new and quite small, as the average age for a business is less than a year and the average number of employees is between one and two—in fact, the business owner is the sole employee in many cases. More than half of all businesses are registered with a local authority (60%), while fewer are registered with Kenya Revenue Authority (28%); about a third are not registered at all (32%). Over a half of businesses (55%) declared they pay a single business permit local fee, a quarter of them pay value added tax and 14% a daily market local fee. The relatively low number of businesses means that it is not possible to perform tests of statistical significance for most of Table B.5.

Table B.5: Household-owned business profile

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Rate of HH business ownership, last 12 months	16	18	16	16	16	12	28
N	1,024	103	921	510	507	61	39
Type of business: ^a							
Manufacturing	2	0	2	1	4	0	0
Selling	71	<u>84</u>	<u>70</u>	<u>80</u>	<u>61</u>	<u>72</u>	<u>93</u>
Transport	3	0	3	4	1	0	0
Professional (including Internet)	0	0	0	0	0	0	0
Other (barber, cleaning, etc.)	25	16	25	16	35	28	7
N	150	18	132	75	74	7	11
Years in operation	1.1	3.1	1.0	1.2	1.0	0.7	4.9
N	150	18	132	75	74	7	11
Number of employees	2	<u>1.2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>1.1</u>	<u>1.2</u>
N	150	18	132	75	74	7	11
Which are...							
Household members	1.3	<u>1</u>	<u>1.3</u>	<u>1.5</u>	<u>1.1</u>	<u>1.1</u>	<u>1</u>
N	150	<u>18</u>	<u>132</u>	<u>75</u>	<u>74</u>	<u>7</u>	<u>11</u>
Non-household members	0.7	<u>0.1</u>	<u>0.7</u>	<u>0.4</u>	<u>0.9</u>	<u>0</u>	<u>0.2</u>
N	150	18	132	75	74	7	11
Revenue in previous month ^b	51,129	<u>12,141</u>	<u>53,495</u>	<u>36,870</u>	<u>64,158</u>	<u>11,008</u>	<u>12,953</u>
N	132	18	114	65	67	7	11
Registration status:							
Local authority (municipal or city council)	60	<u>52</u>	<u>60</u>	<u>45</u>	<u>75</u>	<u>52</u>	<u>51</u>
Kenya Revenue Authority	28	<u>24</u>	<u>28</u>	<u>27</u>	<u>29</u>	<u>35</u>	<u>15</u>
Registrar of Companies	2	<u>0</u>	<u>2</u>	<u>0</u>	<u>3</u>	<u>0</u>	<u>0</u>
None of the above	32	<u>25</u>	<u>33</u>	<u>43</u>	<u>21</u>	<u>13</u>	<u>33</u>
N	150	18	132	75	74	7	11
Share of businesses making fiscal contributions:							
Daily market local fee	14	<u>10</u>	<u>15</u>	<u>19</u>	<u>10</u>	<u>23</u>	<u>0</u>
Single business permit local fee	55	<u>62</u>	<u>54</u>	<u>40</u>	<u>70</u>	<u>77</u>	<u>51</u>
Value Added Tax	25	<u>9</u>	<u>26</u>	<u>20</u>	<u>30</u>	<u>0</u>	<u>15</u>
N	150	18	132	75	74	7	11

Notes:

- a. Households were allowed to choose more than one category so these figures may exceed 100%.
- b. Average over only those businesses operating over the period.

DWELLING TENURE, SECURITY, AND CHARACTERISTICS

C.1 Household Dwelling Characteristics

On average, households in Nyeri have 1.6 people per room, a ratio that significantly differs by household poverty and the gender of household head. Households have an average of one bathroom. Thirty-nine percent of households have a kitchen. This proportion is twice as high in formal settlements (40%) as in informal ones (20%).

Most households in Nyeri cook with charcoal, gas or firewood. Significantly higher percentages of households in formal areas use gas and firewood compared to informal areas, while a significantly lower percentage uses charcoal. A significantly lower proportion of poor households use gas than do non-poor households; on the other hand, significantly larger proportions use charcoal.

Most households are renters (68%), with only small percentages of households that own land and structure of their dwellings (18%), only the structure (9%) and only the land (3%). Significantly more non-poor households than poor households are renters (78% vs. 59%). Therefore, poor households are either more likely to own the structure only or both the land and structure than non-poor households in Nyeri.

Households report quite moderate rates of vulnerability to natural and manmade hazards, with the exception of floods during rains (23%) and living within ten minutes of a legal or illegal garbage dump (34%). As expected, households in formal areas are less likely to experience floods than those in informal settlements (22% vs. 35%). Similarly, informal-settlement households are more exposed to mudslides (42% vs. 8%) and closeness to garbage dumps (56% vs. 33%) than households in formal areas. Interestingly, non-poor households are more likely to be established in areas that are closer to garbage dumps than poor households (39% vs. 30%). Only 3% state that they are exposed to factory pollution in their neighborhood.

Quality of housing varies widely across locations. Forty-six percent of households in informal areas have an earth or clay floor, compared to 15% of those in formal areas—a significant difference. Almost all households have an iron or grass roof (95%), though the proportions are significantly different in formal vs. informal areas and in poor vs. non-poor households. Only 54% of households have stone or brick walls; although the latter is more common in formal areas than in informal areas and among non-poor households than among poor households.

Table C.1: Household dwelling characteristics

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of persons per room	1.6	1.7	1.6	1.8	1.4	1.9	1.3
N	1,016	103	913	504	505	61	39
Number of bathrooms	1	0.8	1	1	1	0.8	0.8
N	1,024	103	921	510	507	61	39
Proportion of residences with kitchen	39	20	40	38	39	22	17
N	1,024	103	921	510	507	61	39
Primary cooking fuel:							
Electricity	4	2	4	3	4	0	3
Paraffin or kerosene	11	21	10	6	15	26	15
Gas	23	3	24	15	32	0	7
Charcoal	44	68	43	47	40	64	73
Firewood	19	6	19	29	7	10	2
N	959	92	867	485	467	51	38
Proportion of households that:							
Total	100	100	100	100	100	100	100
Owens the land only	3	5	3	4	2	5	5
Owens structure only	9	5	9	13	5	8	0
Owens land and structure	18	22	18	22	13	18	30
Rents	68	66	69	59	78	68	60
Squats	1	2	1	2	1	1	4
N	1,023	103	920	509	507	61	39
Pct. of HHs in areas subject to ^a :							
Flooding ^b	23	35	22	21	24	35	32
Mudslides ^c	9	42	8	10	8	48	33
10 minute walk to formal or informal garbage dump	34	56	33	30	39	61	49
Factory pollution (air, water, noise)	3	2	3	2	3	2	3
N	1,024	103	921	510	507	61	39
Housing quality:							
Pct. with earth/clay floor	16	46	15	22	10	43	55
Percent with corrugated iron roof	95	99	94	96	93	100	97
Percent with grass roof	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Percent with stone/brick/block walls	54	<u>22</u>	<u>56</u>	<u>41</u>	<u>67</u>	17	30
N	1,024	103	921	510	507	61	39

Notes:

- All data is self-reported, and therefore subjective.
- Households reported that the area floods during heavy rains.
- Households reported that they are located on a hillside that is subject to mudslides.

C.2 Home and Land Ownership

Table C.2: Household residence and land tenure

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Fe-male-headed
Percent of households that:							
Total	100	100	100	100	100	100	100
Own the land only	3	5	3	4	2	5	5
Own structure only	9	5	9	13	5	8	0
Own land and structure	18	22	18	22	13	18	30
Rent	68	66	69	59	78	68	60
Squat	1	2	1	2	1	1	4
N	1,023	103	920	509	507	61	39
Percent of HHs that feel secure in ownership	69	<u>32</u>	<u>71</u>	<u>69</u>	<u>69</u>	<u>38</u>	<u>24</u>
N	230	29	201	147	79	14	15
Variability of households feeling secure ^(a)	0.04	0.62	0.03	0.06	0.01	0.53	0.63
N	230	29	201	147	79	14	15
Percent of HHs that experienced eviction	2	6	1	2	1	5	7
N	1,024	103	921	510	507	61	39
Proportion of HH owners by type of land-possession document:							
Total	100	100	100	100	100	100	100
None	18	<u>72</u>	<u>15</u>	<u>19</u>	<u>15</u>	<u>73</u>	<u>70</u>
Freehold title	67	<u>20</u>	<u>69</u>	<u>67</u>	<u>65</u>	<u>23</u>	<u>19</u>
Temporary occupation license	0	<u>8</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>5</u>	<u>11</u>
Share certificate	1	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
Government certificate of title ^(b)	5	<u>0</u>	<u>5</u>	<u>1</u>	<u>11</u>	<u>0</u>	<u>0</u>
Letter from chief (provincial administration)	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Other	10	<u>0</u>	<u>10</u>	<u>11</u>	<u>9</u>	<u>0</u>	<u>0</u>
N	254	30	224	163	86	14	15
Neighborhood mobility							
Years in dwelling	7.8	7.6	7.8	8.9	6.5	7.9	5.6
N	1,024	103	921	510	507	924	61
Years in neighborhood	11.4	11.5	11.4	13.3	9.4	11.5	9.5
N	1,023	103	920	510	506	61	39
Home loan payment as a percent of spending power ^(c)	29	-	<u>29</u>	<u>26</u>	<u>33</u>	-	-
N	10	0	10	4	6	0	0

Notes:

- Computed as the intra-class correlation coefficient, where the "class" is the EA. This measures the extent to which households within an EA resemble each other in their feelings of security in ownership. No significance tests performed on this row.
- Long-term lease from City council/Government.
- Computed only for those with a housing loan.

Most households are renters (68%); only small percentages of households own their land and structure (18%), only their structure (9%) and only their land (3%). Sixty-nine percent of households owning their structure reported feeling secure in their ownership. Most household owners (67%) reported having a freehold title for their land, while 18% reported no land possession documents whatsoever. Two percent of households reported being evicted.

The bottom portion of Table C.2 focuses on neighborhood mobility. Households reported living an average of almost eight years in their present dwelling, and about 11 years in their present neighborhood. On average, poor households reported living in their dwellings and in their neighborhoods significantly longer than non-poor households.

C.3 Distribution of Housing Values and Rents

Table C.3: Distribution of housing values and rents

Characteristic	All	Location		House hold has...			H ouse hold head is... ^c		Gender (Informal)	
		Informal areas	Formal areas	Tenure	Water connection	A business	Skilled	Unskilled	Male-headed	Female-headed
Average home value (1,000 KSh) ^a	14,035	<u>2,451</u>	<u>14,614</u>	<u>22,179</u>	<u>38,654</u>	<u>4,034</u>	<u>8,800</u>	<u>16,722</u>	<u>3,990</u>	<u>155</u>
N	231	<u>25</u>	<u>206</u>	<u>149</u>	<u>35</u>	<u>45</u>	<u>71</u>	<u>160</u>	<u>13</u>	<u>12</u>
Distribution of home values: Total	100	100	100	100	100	100	100	100	100	100
1-8,999 KSh	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
9,000-299,999 KSh	55	<u>64</u>	<u>54</u>	<u>37</u>	<u>5</u>	<u>63</u>	<u>69</u>	<u>47</u>	<u>57</u>	<u>75</u>
300,000-999,999 KSh	12	<u>15</u>	<u>12</u>	<u>13</u>	<u>18</u>	<u>13</u>	<u>5</u>	<u>16</u>	<u>8</u>	<u>25</u>
1,000,000-2,499,999 KSh	9	<u>3</u>	<u>9</u>	<u>12</u>	<u>23</u>	<u>8</u>	<u>6</u>	<u>10</u>	<u>5</u>	<u>0</u>
2,500,000-250,000,000 KSh	24	<u>18</u>	<u>25</u>	<u>38</u>	<u>54</u>	<u>16</u>	<u>20</u>	<u>27</u>	<u>30</u>	<u>0</u>
N	231	25	206	149	35	45	71	160	13	12
Average monthly rent (tenants) ^b	2,343	<u>931</u>	<u>2,404</u>	-	<u>4,570</u>	<u>2,350</u>	<u>2,718</u>	<u>2,051</u>	<u>811</u>	<u>1,180</u>
N	667	65	602	-	178	96	275	392	41	22
Distribution of monthly rents: Total	100	100	100	-	100	100	100	100	100	100
1-899 KSh	15	<u>54</u>	<u>13</u>	-	<u>2</u>	<u>10</u>	<u>6</u>	<u>22</u>	<u>56</u>	<u>48</u>
900-1,499 KSh	19	<u>32</u>	<u>19</u>	-	<u>3</u>	<u>13</u>	<u>17</u>	<u>21</u>	<u>38</u>	<u>24</u>
1,500-1,999 KSh	17	<u>6</u>	<u>17</u>	-	<u>3</u>	<u>17</u>	<u>17</u>	<u>16</u>	<u>4</u>	<u>12</u>
2,000-3,499 KSh	29	<u>6</u>	<u>30</u>	-	<u>23</u>	<u>42</u>	<u>33</u>	<u>26</u>	<u>2</u>	<u>12</u>
3,500-150,000 KSh	20	<u>1</u>	<u>21</u>	-	<u>69</u>	<u>17</u>	<u>27</u>	<u>14</u>	<u>0</u>	<u>4</u>
N	665	65	600	-	176	96	275	390	41	22

Notes:

- a. Self-reported, current, monthly, fair-market price (response to the question, "If you were to sell your house, how much do you think you could sell it for?").
- b. Excludes imputed owner-occupied rents.
- c. Includes those self-declared as "skilled" as well as "professional".

About 76% of respondents reported their home values to be between 9,000 KSh and 2.5 million KSh, and 24% reported home values over 2.5 million KSh; the average value was 14 million KSh.¹⁴

Average rent is 2,343 KSh per month. The relatively high rate of non-reporting of these figures means that it is not possible to perform tests of statistical significance for most of the bottom panel of Table C.3.

C.4 Neighborhood Social Capital and Civic Participation

Respondents that own their homes are more likely than renters to participate in their community. Forty-four percent of owners attended local councils (compared to only 17% of renters) and 48% attended neighborhood forums (compared to 22% of renters). In informal areas, significantly more male-headed households reported they attended a neighborhood forum than female-headed households (32% vs. 7%). Owners are also more significantly likely to have voted in all types of elections and to have participated in the 2010 referendum.

About half (20%) of respondents reported that they had an informal community or neighborhood leader; households in the lower half of access to infrastructure and owners were more likely to report there was an informal community or neighborhood leader. Very few respondents (3%) said that they had participated in a public demonstration or protest.

The survey asked respondents whether people in their neighborhood would cooperate if asked by an official to conserve water or electricity because of an emergency, and whether people in their neighborhood look out for each other. On both questions, the results were positive. When asked if people in their community would cooperate if asked by an official, the responses averaged 3.4 on a four-point scale (where 4="very likely" and 1="very unlikely" to cooperate). When respondents were asked if they agreed that people look out and trust each other in their neighborhood, answers averaged 4.3 on a five-point scale (where 1="strongly disagree" and 5="strongly agree"). On both questions, there were slight differences between formal and informal areas, people with high and low access to infrastructure and by tenure status, although all these differences were statistically significant. Sixty-one percent of respondents said they felt safe in their own neighborhood. A considerably larger percentage of respondents with higher access to infrastructure reported feeling secure than those in the lower half of access to infrastructure (63% vs. 54%). Also, among owners, 80% of respondents felt safe in their own neighborhood compared to 54% of tenants.

¹⁴ Note that there are about 20 high dwelling values in Nyeri which increase the average. These appeared to be clustered in one or two areas – perhaps exceptionally wealthy EAs.

Table C.4a: Neighborhood social capital and civic participation

Characteristic	All	Location		Access to infrastructure ^a		Gender (Informal)		Tenure ^b	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Civic participation									
Percent of households... contacting local council	24	24	24	22	25	32	12	44	17
N	1,024	103	921	276	748	61	39	278	745
attending a neighborhood forum	29	22	29	29	29	32	7	48	22
N	1,024	103	921	276	748	61	39	278	745
Social activism									
Percent of households voting in... local election ^c	41	32	41	38	41	41	21	68	31
N	1,024	103	921	276	748	61	39	278	745
2007 general election ^(c)	67	50	68	63	69	49	52	82	62
N	1,024	103	921	276	748	61	39	278	745
2010 referendum ^c	76	58	77	70	78	57	58	86	72
N	1,024	103	921	276	748	61	39	278	745
Percent of households with informal community or neighborhood leader	20	27	20	26	18	33	18	37	13
N	975	100	875	270	705	60	38	278	696
Percent of households that took part in a public demonstration or protest	3	1	3	1	4	1	0	2	4
N	1,024	103	921	276	748	61	39	278	745

Notes:

- a. Defined by dividing the population in half based on a score assigned using responses from thirteen infrastructure-related questions (see Section 3 of Introduction.)
- b. Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- c. Out of all households and not just those registered to vote.

Table C.4b: Neighborhood social capital and civic participation

Characteristic	All	Location		Access to infrastructure ^a		Gender (Informal)		Tenure ^b	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Social capital									
Average HH response to:									
People in my neighborhood cooperate if asked by an official ^(f)	3.4	3.1	3.5	3.5	3.4	3.1	3.1	3.6	3.4
N	1,014	102	912	272	742	60	39	278	735
People in my neighborhood look out for/trust each other ^(d)	4.3	4.0	4.3	4.0	4.3	4.0	4.0	4.6	4.2
N	1,023	102	921	275	748	60	39	278	744
Proportion of HHs feeling safe from crime in own neighborhood	61	58	61	54	63	68	44	80	54
N	1,024	103	921	276	748	61	39	278	745

Notes:

- a. Defined by assigning scores using responses from thirteen infrastructure-related questions.
- b. Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- c. Four-point scale where 1="Very unlikely" to 5="Very likely".
- d. Five-point scale where 1="Strongly disagree" to 5="Strongly agree".

INFRASTRUCTURE SERVICES

D.1a Water Access

Twenty-three percent of households in Nyeri have a private piped water connection in their dwelling, a proportion which is significantly higher in formal areas (24%) than in informal areas (0%) and among non-poor households (31%) than poor households (15%). Seventy-eight percent households have piped water in their compound. This varies significantly by area type, while 79% of households in formal areas reported piped connections in their compounds, only 54% of those in informal settlements reported so. Finally, eight-one percent of households are close (within 50 meters) to a source of piped water. On average, it takes respondents about 42 minutes a day to obtain water, including travel to and from the water source, waiting time, and filling time. Water costs an average of 565 KSh a month. Although there was not enough data at the census tract level to test for statistically significant differences between categories of households for the cost of water in time or money, we note that there are numerical differences. Households in informal areas spend slightly more time but less money obtaining water than those in formal areas, female-headed households spend considerably more money than their male-headed counterparts, and poor households spend more time and considerably less money (378 KSh vs. 733 KSh) than wealthier households, perhaps reflecting an overall lack of resources to devote to obtaining water.

Despite the fact that 33% of households have piped water in their dwellings, only 21% of respondents report that piped water is their most important water source. Seventy-percent of households report that a shared yard tap is their most important source of water. Another 5% name neighbor(s) as their most important source and 2% declared they obtain water from other vendors. Access to piped water as a primary source considerably varies by location type, poverty status, and respondents' security in their home ownership, where "secure" represents owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" represents owners who feel they could be forced out, and "rent" represents those who rent their homes and therefore have no security of ownership as well as squatters and those who own their dwelling but not land. Therefore, those respondents who feel secure of their home ownership were more likely to obtain piped water than those who felt insecure (16% vs. 10%); in addition, 23% of renters reported piped water as their primary water source. Non-poor households are more likely than poor households to obtain water from pipelines (29% vs. 14%), and are less likely to obtain water from shared tap connections (67% vs. 74%) and neighbors (3% vs. 7%); all differences are statistically significant. Piped water services—especially private piped connections—are considerably more common in formal areas than in informal settlements, where more households primarily obtain water from vendors, neighbors and other natural sources outside the household; 53% of households in informal areas reported their primary water source was a shared tap connection, compared to 71% of households in formal settlements.

Of the households that did not have access to piped water, the main reason given (52%) was because they rented rather than owned their home and their landlord would not pay for a connection; the second most common reason (23%) was inability to afford the initial connection (although very few were unable to afford a water bill). Only 12% of respondents reported that the water provider had a waiting list, and 12% said they had other sources available.

Table D.1a: Water access

Characteristic	All	Security of Ownership ^a			Location		House hold poverty		Gender (Informal)	
		Secure	Insecure	Rent	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with private piped water connection inside dwelling	23	19	13	24	0	24	15	31	0	0
N	1024	155	75	793	103	921	510	507	61	39
Percent of households with piped water connection in compound	78	84	79	77	54	79	79	78	54	54
N	1,024	155	75	793	103	921	510	507	61	39
Percent of households close to piped water access ^b	81	95	51	82	70	85	78	91	75	60
N	102	13	15	74	44	58	73	28	26	17
Monthly cost of water in... Time (minutes) ^c	293	296	166	309	280	297	308	251	239	218
N	116	19	15	82	45	71	83	32	26	18
Money (KSh)	565	552	791	538	594	563	378	733	415	865
N	652	144	66	441	71	581	319	329	42	27
Most important water source: Total	100	100	100	100	100	100	100	100	100	100
Piped	21	16	10	23	0	22	14	29	0	0
Bottled	0	0	0	0	0	0	0	0	0	0
Shared tap connection	70	73	78	69	53	71	74	67	54	52
Vendor (kiosk, tanker, other)	2	2	7	1	20	1	2	1	15	26
Neighbor(s)	5	7	2	5	17	4	7	3	21	11
Well/borehole	0	0	0	0	0	0	0	0	0	0
Natural source outside household	1	1	3	1	10	1	2	1	10	11
N	1,024	155	75	793	103	921	510	507	61	39
No connection due to:	100	100	100	100	100	100	100	100	100	100
Other sources available	12	0	4	16	25	7	12	10	29	13
Renting ^d	52	0	32	67	50	52	43	82	44	63
Can't afford connection	23	63	47	10	18	25	29	4	20	17
Can't afford monthly bill	1	0	0	1	3	0	0	3	0	7
Provider has waiting list	12	37	17	6	4	15	17	0	7	0
No service available	1	0	0	1	0	1	0	2	0	0
Other	0	0	0	0	0	0	0	0	0	0
N	102	13	15	74	44	58	73	28	26	17

Notes:

- Self-reported; "secure" includes owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" includes owners who feel they could be forced to leave without an official legal process, and "rent" includes renters, squatters, and people who own their structure but not land.
- Respondents were asked whether there were dwellings or businesses within 50 meters of their home that had a piped water connection in the dwelling or compound.
- Calculated as the sum of time spent travelling, waiting in line, and filling containers.
- House does not have a connection and landlord will not pay for one.

D.1b Water Quality

Water quality is generally rated “good” or “fair,” although all households that obtain water from wells or boreholes and 88% using a natural source rate their water quality to be fair or poor.

Table D.1b: Water quality

Characteristic	All	House hold poverty		Location		Water quality					Gender (Informal)	
		Poor	Non-poor	Informal areas	Formal areas	Good	Fair	Poor	Total	N	Male-headed	Female-headed
Water source: ^(a)	21	14	29	0	22	81	19	0	100	221	0	0
Piped												
Bottled	0	0	0	0	0	-	-	-	-	0	0	0
Shared tap connection	70	74	67	53	71	80	19	0	100	696	54	52
Other vendor	2	2	1	20	1	43	57	0	100	28	15	26
Neighbor(s)	5	7	3	17	4	92	7	1	100	52	21	11
Well/Borehole	0	0	0	0	0	0	100	0	100	1	0	0
Natural outside-HH source	1	2	1	10	1	12	51	37	100	24	10	11
N	1,024	510	507	103	921	787	224	13			61	39
Water provider: Public	89	84	94	97	89	87	12	0	100	820	98	95
Private	0	0	0	0	0	0	100	0	100	1	0	0
Self	8	11	6	3	8	23	77	0	100	71	2	5
Community	3	5	0	0	3	38	62	0	100	30	0	0
N	922	437	479	59	863	728	193	1			35	22
Percent of households treating drinking water	20	16	24	18	20	81	16	3	100	204	15	20
N	1,024	510	507	103	921	787	224	13			61	39
Treatment method: ^(b)	94	96	93	80	95	80	17	3	100	191	61	100
Boiling												
Add bleach/chlorine	91	7	11	32	8	80	14	6	100	23	10	7
Other (sieve, filter, settle)	1	0	1	0	1	100	0	0	100	2	0	0
N	204	80	121	19	185	159	36	9			10	7

Notes:

- Most important water source.
- Since multiple responses were permitted, the sum can exceed 100%. Likewise, “Other” is not shown, since it was negligible, so the sum may also be less than 100%.

Although most respondents purchase their water from a public utility (89%), a few of them declared they supply themselves (8%) or obtain it from their communities (3%). Only 20% of the households in Nyeri treat their water in any way; of those that treat water, most boil it (34%) or add bleach or chlorine (91%).

D.2a Electricity and Waste-Disposal Services

Seventy-two percent of respondents reported access to electricity, a figure that differs significantly by poverty (83% of non-poor vs. 60% poor) and settlement type (73% in formal vs. 31% in informal). Reasons for not having a connection are similar to those for water—the primary reason reported was that households did not own their home and didn't have a choice (45%), followed by inability to pay for the initial connection (28%) and the fact that the electricity company had a waiting list (24%). Only 17% of respondents reported functional street lighting in their area, which differs significantly between informal and formal locations (50% vs. 15%). Street lighting is significantly more commonly reported by non-poor households than by poor households (21% vs. 13%).

The average monthly bill for those with electricity is 699 KSh a month. Ten percent of households with electricity do not pay for it. Electricity payments are primarily made to the public utility (77%), followed by prepaid cards (12%), renters that pay their landlord instead (9%), and a few respondents that pay a third party (2%). Even when electricity is available, it is not particularly reliable; 23% of respondents experience outages on a weekly basis or more.

Thirty-five percent of sample-households in Nyeri reported getting rid of their refuse by dumping it in their neighborhood or compound; this is significantly more common among informal areas than in formal settlements. Thirty-one percent of households declared they burn refuse, and households in formal areas are more likely to use this technique to manage their refuse than those in informal areas (32% vs. 24%). Less than a fifth (17%) of households use a collection system and non-poor households are more likely to use one than poor households (25% vs. 9%). Only 57% of households that use a refuse collection system actually pay for it.

Table D.2a: Access to electricity and waste-disposal

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-head-ed	Fe-male-head-ed
Electricity							
Proportion of households with access to electricity	72	31	73	60	83	30	32
N	1,024	103	921	510	507	61	39
Reason for no connection: Total	100	100	100	100	100	100	100
Renters	45	<u>69</u>	<u>42</u>	<u>39</u>	<u>61</u>	<u>73</u>	<u>62</u>
Firm has waiting list	24	<u>10</u>	<u>26</u>	<u>26</u>	<u>19</u>	<u>8</u>	<u>14</u>
Cannot afford connection	28	<u>20</u>	<u>29</u>	<u>33</u>	<u>18</u>	<u>20</u>	<u>22</u>
Cannot afford monthly bill	0	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>3</u>
Other	2	0	3	2	2	0	0
N	332	74	258	228	102	44	28
Percent of households with mostly functioning street lighting	17	50	15	13	21	54	42
N	1,024	103	921	510	507	61	39
Average monthly bill, KShs	699	<u>644</u>	<u>700</u>	<u>638</u>	<u>725</u>	<u>740</u>	<u>329</u>
N	1,024	103	921	510	507	61	39
Percent of households not paying for electricity	10	<u>14</u>	<u>10</u>	<u>10</u>	<u>9</u>	<u>5</u>	<u>27</u>
N	496	22	474	199	292	12	9
Payment to: Total							
Utility	77	<u>63</u>	<u>77</u>	<u>67</u>	<u>84</u>	<u>70</u>	<u>47</u>
Prepaid card	12	<u>0</u>	<u>12</u>	<u>17</u>	<u>8</u>	<u>0</u>	<u>0</u>
Landlord	9	<u>37</u>	<u>8</u>	<u>12</u>	<u>7</u>	<u>30</u>	<u>53</u>
Third party (from utility power line)	2	<u>0</u>	<u>2</u>	<u>4</u>	<u>1</u>	<u>0</u>	<u>0</u>
N	445	18	427	176	264	11	6
Percent of households with outages at least once weekly	23	<u>12</u>	<u>23</u>	<u>18</u>	<u>27</u>	<u>10</u>	<u>17</u>
N	692	29	663	282	405	17	11
Refuse disposal							
Main method:							
Dumping	35	51	34	36	34	50	55
Burying	17	14	17	22	11	15	11
Burning	31	24	32	33	30	24	22
Collection system(a)	17	12	17	9	25	11	13
N	1,023	103	920	510	506	61	39
Proportion of HHS paying for collection	57	<u>61</u>	<u>56</u>	<u>35</u>	<u>65</u>	<u>75</u>	<u>47</u>
N	177	9	168	48	128	3	5

D.2b Access to Sanitation Services

Only 22% of households reported that they have a toilet in their home, and this significantly varies by location and poverty status; whereas 23% of households in formal areas have a toilet at home, only 2% of those in informal settlements have one. Likewise, 31% of non-poor households have a toilet at home, compared to only 13% of poor households. Interestingly, on average most households use flush toilets (36%), followed by pit latrines (34%), public latrines (20%) and VIP latrines (9%). Households in formal settlements are much more likely to use a flush toilet and less likely to use a public latrine or pit latrine. Non-poor households are more likely to use a flush toilet (49% vs. 23%) and less likely to use a pit latrine (23% vs. 45%) than poor households.

Table D.2b: Access to sanitation

Characteristic	All	Location		HH poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with toilet in home	22	2	23	13	31	4	0
N	1,024	103	921	510	507	61	39
Type of toilet system: Total							
Pit latrine (individual)	34	45	34	45	23	52	36
VIP latrine	9	10	9	10	9	6	17
Flush toilet/WC	36	7	37	23	49	3	13
Public/shared latrine	20	37	20	22	19	39	31
Paid shared latrine	0	0	0	0	0	0	0
N	1,024	103	921	510	507	61	39
Percent of households sharing toilet:							
Doesn't share	40	23	41	38	43	18	32
Shares with 2-9 other households	52	70	51	55	49	76	61
Shares with 10+ other households	8	6	8	7	8	5	7
N	1,009	101	908	503	499	61	37
Type of disposal system for toilet:							
Total	100	100	100	100	100	100	100
Pit latrine	61	92	60	75	48	95	88
Sewer (legal)	34	5	36	22	47	4	4
Sewer (informal)	2	1	2	2	2	1	2
Septic tank/soak pit	3	2	3	2	3	0	6
N	1,019	102	917	509	503	61	38
Disposal of "grey water": Total							
Total	100	100	100	100	100	100	100
Dump into drain	40	32	40	32	48	29	34
Pour onto road	42	53	42	48	36	55	52
Pour into latrine	7	2	7	8	5	3	0
Other	11	13	11	11	10	13	14
N	1,024	103	921	510	507	61	39

The majority of households (60%) share a toilet with several other families. Compared to households in informal areas, significantly more households in formal areas do not share toilets at all, while significantly fewer share with 10 or more other households. Most toilets (61%) drain into pits; more than a third of them (36%) use toilets connected to a formal or informal sewage system, and only 3% have a septic tank.

“Grey water” (waste water from washing, cleaning, etc.) is generally poured out into the road (42%) or dumped down the drain (40%). Households in formal settlements are more likely to dump their grey water down the drain than pour it into the street than households in informal settlements. Non-poor households are more likely to dump their grey water into the drain and less likely to pour it onto roads.

D.3 Access to Transport

Almost the same proportion of household member work or study either outside (42%) or inside (41%) their neighborhood, and 18% of households reported their members work or study both outside and inside. Almost all respondents commute on foot (74%) or via a matatu (20%).¹⁵ People in informal areas and poor households are significantly more likely to walk, and typically less likely to use a matatu than members of wealthier households and those located in formal settlements. Only 1% of household members drove to work in their own vehicle.

Average one-way transport time is 17 minutes. Members from male-headed households take longer trips to school or to work than members from female-headed households. Of the respondents that had to pay to travel, the average one-way cost is 86 KSh.

Fifty-one percent of respondents said that their access to roads is generally good. Respondents from formal areas are more likely to report the good quality of their roads, compared to a larger proportion of respondents from informal areas that tend to report roads in poor condition. Thirty-one percent of households have limited road access during the rainy season; while 54% of those in informal settlements experience limited road access during the rainy season, only 30% of households in formal areas do.

¹⁵ A “matatu” is a 14-seater minivan used throughout Kenya as a form of public transport.

Table D.3: Access to transport

Characteristic	All	House hold activity ^a		Location		House hold poverty		Gender (Informal)	
		Work	Study	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent who work or study...									
inside the neighborhood	41			<u>34</u>	<u>41</u>	<u>46</u>	<u>35</u>	28	48
outside the neighborhood	42			<u>46</u>	<u>42</u>	<u>33</u>	<u>50</u>	46	46
inside and outside the neighborhood	18			<u>20</u>	<u>17</u>	<u>20</u>	<u>15</u>	26	6
N	1,140			106	1,034	585	548	76	30
Main mode of travel ^b	74	<u>89</u>	<u>99</u>	<u>93</u>	<u>73</u>	<u>84</u>	<u>62</u>	92	93
Walk									
Bicycle	1	<u>0</u>	<u>0</u>	0	1	1	1	0	0
Own vehicle	1	<u>0</u>	<u>0</u>	0	1	1	2	0	0
Matatu	20	<u>8</u>	<u>1</u>	6	21	13	28	8	0
Shared taxi	0	<u>0</u>	<u>0</u>	0	0	0	0	0	0
Bike taxi	0	<u>1</u>	<u>0</u>	1	0	0	0	0	2
Municipal bus	2	<u>0</u>	<u>0</u>	0	2	0	4	0	0
N	1,584	88	54	142	1,442	851	723	100	42
Transport time (minutes)	17	<u>18</u>	<u>17</u>	18	17	17	17	20	11
N	1,581	<u>88</u>	<u>54</u>	142	1439	849	722	100	42
One-way trip cost to work/school (KSh)	86	<u>138</u>	<u>300</u>	<u>149</u>	<u>85</u>	<u>92</u>	<u>83</u>	<u>200</u>	<u>0</u>
N	371	9	1	10	361	123	244	7	3
Households with road access as:	49			67	48	52	45	67	66
Poor									
Good	51			33	52	48	55	33	34
N	1,024			103	921	510	507	61	39
Percent of households with limited road access during rainy season	31			54	30	31	32	48	64
N	1,024			103	921	510	507	61	39

Notes:

a. Informal areas only.

b. To work or to school. May not add to 100% since "Other", which was negligible, is not reported in table

D.4 Access to Communications

While land lines are practically nonexistent among households in Nyeri, mobile phone ownership is widespread. The average household owns 1.3 mobile phones. The number owned varies significantly by area type. A quite large number of those with mobile phones use mobile banking (70%), with significant differences by area type and poverty. On the other hand, relatively few respondents have a computer (6%), though the rate of computer ownership is significantly higher in formal areas and among non-poor households. Only 21% reported accessing the internet using any means, a figure which is significantly higher among households in formal settlements than informal settlements (21% vs. 8%), and among non-poor households than poor households (28% vs. 13%).

Table D.4: Access to communications

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with functioning land line	1	0	1	1	1	0	0
N	1,024	103	921	510	507	61	39
Average number of mobile phones owned by household	1.3	1.0	1.3	1.3	1.3	1.0	0.9
N	1,022	103	919	508	507	61	39
Percent of households using mobile banking	70	53	70	65	74	59	43
N	1,024	103	921	510	507	61	39
Percent of households with functioning computer	6	0	6	3	9	<u>0</u>	<u>0</u>
N	1,024	103	921	510	507	61	39
Percent of households using internet (any means)	21	8	21	13	28	7	10
N	1,024	103	921	510	507	61	39

D.5 Access to Infrastructure Indicator

The access to infrastructure indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5.¹⁶ Higher scores represent better access to infrastructure. This indicator provides an overall understanding of a household's infrastructure access. By averaging households' scores on the indicator, we can quickly compare infrastructure access in informal and formal areas, between poor and non-poor households, and between male- and female-headed households in informal areas.

Table D.5 presents household mean scores on the access-to-infrastructure indicator. The mean score across all households in Nyeri is 4.89. Households in formal areas score significantly higher than households in informal areas, and the difference in mean scores is quite large—greater than one. There are also significant differences between poor and non-poor households (4.40 vs. 5.39), but the magnitude of this difference is less than the difference between formal and informal areas.

Table D.5: Access to infrastructure indicator

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Mean score on access to infrastructure indicator	4.89	3.28	4.96	4.40	5.39	3.28	3.26
N	1,024	103	921	510	507	61	39

¹⁶ The 13 subcategories are: piped water (1 point); shared/indirect connection (0.5 points); direct electricity access (1); street lighting (0.5); garbage collection system (1); own toilet (1); shared toilet with less than 20 other people (0.5); legal sewer system for toilet (0.5); grey water not poured onto street (0.5); good road access at dwelling (0.5); road access not limited during rainy season (0.5); no flooding (1); no mudslides (1).

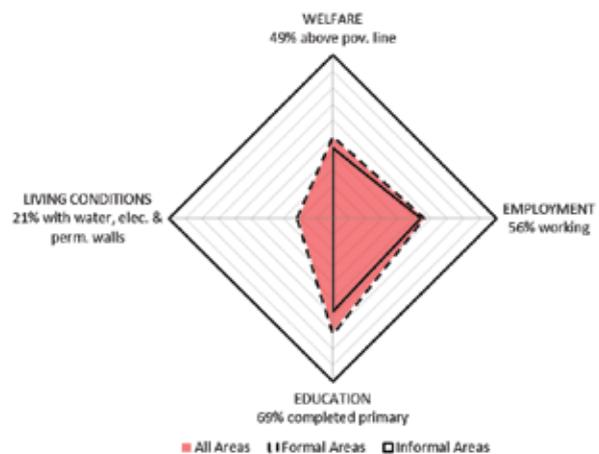
CONCLUSIONS

The following three figures are “Development Polygons”. These polygons are meant to complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. We present information for all areas, along with formal and informal areas, in each of the three figures: the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.¹⁷ In all figures, the value labels included provide the value of the indicator for all areas. The statistics underlying these figures are also in the tables, above. Similar graphics also appear in the City-at-a-Glance Reports and the Overview Report produced under the NORC contract.

The axes for all figures represent percentages. Polygons with larger areas represent a “better” situation in regards to the associated indicator(s). Hence, a polygon with full coverage would indicate that the city is doing very well in terms of development, infrastructure, or living conditions.

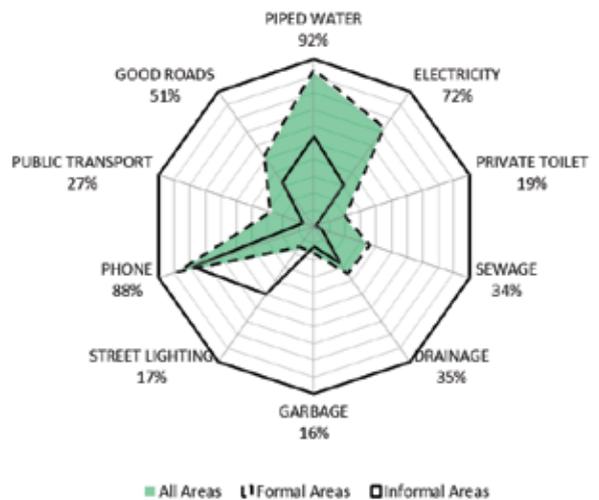
The Development Diamond (Figure 1) maps four indicators of poverty—welfare, employment, education, and living conditions. In three quarters of the development diamond—welfare, employment, and education—formal and informal areas are similarly situated. However, households in formal areas far outpace the households in informal areas in terms of living conditions—in formal areas, a much larger percentage of households have permanent walls and access to both piped water and electricity (35% vs. 11% in informal areas and 28% overall).

Figure 1: Development Diamond



The Infrastructure Polygon, shown in Figure 2, presents residents’ access to ten different types of infrastructure - piped water, electricity, private toilets, sewage, drainage, garbage collection, street lighting, mobile phones, public transport, and good roads. Piped water and electricity are much more prevalent in formal areas (79% and 71%, respectively) than informal areas (54% and 53%), though over half of the population in all areas has access to each. Private toilets are much less common overall, but we still find large differences by area type—only 5% of households in informal areas, compared to 28% in formal areas, have a private toilet. Sewage follows a similar trend. Twenty-five percent of households or less have drainage or

Figure 2: Infrastructure Polygon

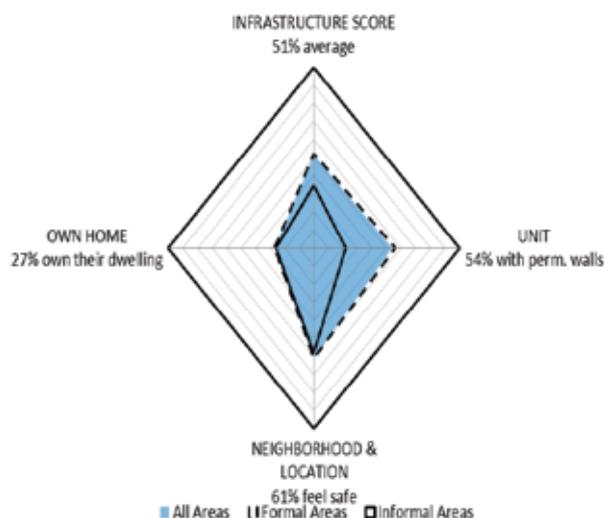


¹⁷ The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

garbage collection. Interestingly, more households in informal areas report functioning street lighting than do households in informal areas—25% versus only 13%. Mobile phone usage is nearly ubiquitous, as 72% of households in informal areas and 82% of households in formal areas own one or more mobile phones. About half of all households report using public transport— 44% in informal areas and 53% in formal areas. Finally, 62% of households (55% in informal areas and 65% in formal areas) said that their access road was in good condition.

Figure 3 presents the Living Conditions Diamond. The four axes of this diamond are the infrastructure score (scaled to a percentage of the total possible points), unit conditions, neighborhood and location, and home ownership. The first three indicators have coverage over 50%, with informal areas, scoring below formal areas. Home ownership, on the other hand, does not considerably vary by location type, but by poverty level; while only 18% of poor households own their dwelling, 35% of non-poor households own theirs. The largest difference between formal and informal areas occurs on the unit indicator—56% of households in formal areas have permanent walls, while only 22% of households in informal areas do.

Figure 3: Living Conditions Diamond



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